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ABSTRACT

This booklet provides information and examples from the Mathematics Missouri Assessment Program (MAP) for intermediate levels, given in the spring of 1998. These materials include the released items, anchor papers, and scoring guides. The MAP items consist of constructed responses and performance tasks from the state assessment. Anchor papers were selected from student work and represent the different levels of achievement as established through the scoring guides. There are several errors in general that seem to be prevalent among students. Students should be instructed in ways that will help them avoid such errors. Six strategies that should be emphasized to students at all levels to avoid those errors are presented. (ASK)

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Navigating the MAP: Mathematics

INTERMEDIATE

- Released Items
- Scoring Guides
- Anchor Papers

Spring 1998

Missouri Department of Elementary and Secondary Education

SE030630

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Introduction

This booklet provides information and examples from the Mathematic's Missouri Assessment Program (MAP), given in the spring of 1998. These materials include the released items, anchor papers and scoring guides. The MAP items consist of constructed responses and performance tasks from the state assessment. No *TerraNova* items (multiple choice format) are being released.

Anchor papers were selected from student work and represent the different levels of achievement as established through the scoring guides. Student work is evaluated against these anchors to determine the appropriate student score. Annotations (in boxes) or on corresponding pages are shown with each anchor to explain the reason for assigning the indicted score.

There are several errors that in general seem to be prevalent among students. Students should be instructed in ways that will help them avoid such errors. The following strategies should be emphasized to students at all levels:

1 ***Show work***

If the prompt asks for work to be shown then the student must include this work in the response. The ability to demonstrate the process is a major focus for constructed responses and performance events.

2 ***Communicate ideas clearly***

Student work must be organized and clearly communicate the ideas of problem solving. Individuals scoring these items are instructed not to second guess what the student has proposed as a response. Work should indicate logical and sequential steps that clearly demonstrate student understanding.

3 ***Determine reasonableness of solution***

In many questions, solutions were given that were quite unreasonable. Students should be encouraged to reflect upon their response in relation to the information provided and to what the prompt is requesting. In cases where basic computations were involved, good estimation skills would be most beneficial.

4 ***Check all conditions***

Some items(especially performance tasks) require multiple conditions to be met. Students may find an appropriate solution but may not demonstrate that this satisfies all of the conditions indicated in the problem. Students must indicate that conditions are met and that the proposed solution is appropriate.

5 ***Choosing correct operations and formulas***

Some students solve word problems by simply counting the number of numbers that may appear in the problem or use inappropriate formulas based upon word expressions given in the problems. For example, students might select to use addition because several numbers are listed without little recognition of the problem content. Students must read for understanding and have a repertoire of problem solving strategies.

6 ***Inappropriate use of tools***

Students had problems using some of the manipulatives provided. Students at grade 4 could not associate the correct geometric names with individual pattern blocks. In higher grades, many students could not appropriately read a protractor or make correct substitutions in formulas.

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Released Items

This picture means that you will use your ruler.

This picture means that you will use your coins.

This picture means that you will use your pattern blocks.

Session 1

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68930-98

Glee Club

Directions

Numbers 1 through 3 are about a school Glee Club preparing for its winter concert. Show all of your work and write your answers directly in this booklet.

1 In preparing for their winter concert, the Glee Club purchased 5 gallons of paint to create a backdrop for the stage. The total bill for the paint was $109.73, including $5.23 sales tax. The club's sponsor wants to know the cost of ***one*** gallon of paint.

To find the cost of one gallon of paint, solve the equation $5n + \$5.23 = \$109.73$, where n represents the number of gallons of paint. In the box below, provide the work that shows how you arrived at your answer.

2 Janette, Carl, and Milo are performing a special number in costume during the concert. Each of their costumes will require $3\frac{5}{8}$ yards of material for the outfit and another $1\frac{3}{4}$ yards of material for the hat.

How much material is needed in all for the 3 complete costumes? In the box below, provide the work that shows how you arrived at your answer.

3 The Glee Club kept track of the attendance at each of their 4 performances. At the end of the 4 performances, they had the following information:

ATTENDANCE PER PERFORMANCE

Performance	Student	Adult
1	75	120
2	95	136
3	110	126
4	100	150

What was the adult mean (average) attendance at the concerts? In the box below, provide the work that shows how you arrived at your answer.

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Recycling Program

Directions

Numbers 4 through 6 are about a recycling program. Show all of your work and write your answers directly in this booklet.

Your school started a recycling program to earn money to pay for some school activities and teach students about saving natural resources. The tables below show the number of pounds of aluminum cans and newspapers collected in 3 weeks by each grade. Study the tables. Then do Numbers 4 and 5.

GRADE 6

Week	Pounds of Aluminum Cans	Pounds of Newspapers
1	11.7	252
2	14.75	241
3	12.8	219

GRADE 7

Week	Pounds of Aluminum Cans	Pounds of Newspapers
1	12.1	288
2	13.2	227
3	14.0	254

GRADE 8

Week	Pounds of Aluminum Cans	Pounds of Newspapers
1	8.3	254
2	17.4	213
3	13.5	293

Go On

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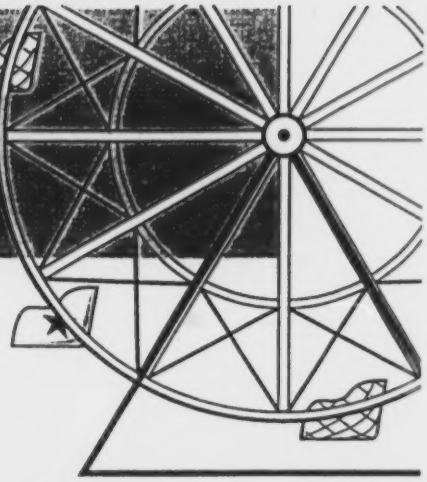
4 Which grade collected the ***greatest*** number of pounds of aluminum cans during the 3-week period? In the box below, provide the work that shows how you arrived at your answer.

5 What procedure could you follow to estimate the total number of pounds of aluminum cans collected by ***all*** of the grades at the end of a 10-week period?

6 Your class has decided to crush the cans to save space. A full-size can is 5 inches tall, while a crushed can is 1 inch tall. If 175 full-size cans will fit into a garbage bag, about how many crushed cans will fit into the same bag? In the box below, provide the work that shows how you arrived at your answer.

AMUSEMENT PARK



Directions

Numbers 7 through 9 are about an amusement park. Show all of your work and write your answers directly in this booklet.

7 A family of four wants to spend 4 days at the Fun Land amusement park. There are three options for purchasing individual entrance passes for Fun Land. The table below shows the prices for the different options.

PASS PRICES

Type of Pass	Price
One-day	$27.95
Three-day	$80.95
Five-day	$134.95

Which pass or combination of passes will be the ***least*** expensive for a family of four to purchase during their stay at Fun Land amusement park? In the box below, provide the work that shows how you arrived at your answer.

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Go On

8 The table below lists the costs of one-day passes at Fun Land over the last ten years.

ONE-DAY PASS PRICES AT FUN LAND

Year	Price
1985	$18.00
1987	$19.00
1989	$21.50
1991	$23.00
1993	$24.50
1995	$26.50

If the trend in the cost of passes continues, what do you predict would be the cost of a one-day pass in the year 2005? In the box below, explain how you arrived at your answer.

9 Fun Land has two very popular games on the midway. One of the games has 3 different prizes you can win and the other game has 5 different prizes. How many different combinations of one prize from each game could a player win? In the box below, provide the work that shows how you arrived at your answer.

Directions

Show all of your work and write your answers directly in this booklet.

10 You and other members of the Truman Middle School Science Club have purchased a 35-gallon aquarium tank and all the accessories needed to keep tropical fish. Using the information in the following tables, you will decide which species of fish and plants to put into the tank. You must keep in mind the following restrictions:

- You must spend between $65 and $75.
- The combined lengths of the fish in inches must not exceed the number of gallons of water in the tank.
- The total number of plants should not exceed 10.
- You must purchase ***at least*** 5 kinds of fish and 2 kinds of plants.

On Page 15, construct a table that shows you have met the above restrictions.

In your table include the:

- names of the plants and fish you want to purchase
- total cost of the plants and fish you want to purchase
- total length of the fish you want to purchase

TROPICAL FISH

Name	Cost (per fish)	Length (in inches)	Characteristics
Algae Eater	$1.45	1	bottom feeder; lays eggs
Angelfish	$8.95	3	striped with long pointed fins; lays eggs
Catfish	$1.95	1	bottom feeder with whiskers; lays eggs
Clown Barb	$1.45	$1\frac{1}{4}$	orange and black stripes; lays eggs
Clown Loach	$5.95	3	orange and black stripes; bottom feeder; lays eggs
Gourami	$3.95	$2\frac{1}{2}$	pearl in color; lays eggs in bubble nests
Guppy	$0.35	1	colorful fancy tails; bears live young
Mollie	$2.45	$1\frac{1}{2}$	black in color; bears live young
Platy	$0.95	$1\frac{1}{2}$	orange in color; bears live young
Neon Tetra	$1.25	$\frac{3}{4}$	colorful blue and red bodies; lays eggs
Redtail Shark	$5.95	3	dark gray in color with red tail; lays eggs
Silver Hatchets	$2.95	$\frac{3}{4}$	silver in color; lays eggs

TROPICAL PLANTS

Name	Cost (per plant)	Length (in inches)	Characteristics
Elodea	$0.75	8	floats or roots in gravel
Fan Plant	$1.95	6	roots in gravel
Wisteria	$2.95	12	roots in gravel
Sword Plant	$5.95	12	roots in gravel

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Session 2

Directions

Show all of your work and write your answers directly in this booklet.

1 Your local high school marching band is marching in today's state fair parade. The band, composed of 126 students, usually marches in 21 rows of 6 students each. Due to illness, several band members are unable to march in today's parade.

As drum major, you must assist the band director in rearranging the students into rows of equal numbers of students. When you tried 4 students in each row, the last row was 1 student short. The results were the same when rows of 5 and 6 students were arranged. When you arranged the band into rows of 7 students, all rows were complete.

Use the above information to determine how many students showed up to march in the parade. In the box below, show your work and explain the process you used to find the number of students present on the day of the parade.

19

Directions

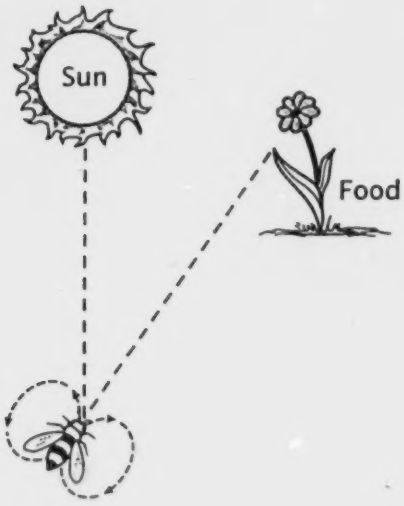
Numbers 2 through 4 are about honeybees. Show all of your work and write your answers directly in this booklet.

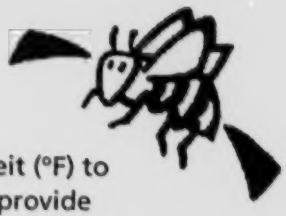
2 Each square inch of honeycomb contains approximately 25 cells. About how many cells would be found in a honeycomb that measures 8 inches by 12 inches? In the box below, provide the work that shows how you arrived at your answer.

3 Use your protractor to help you solve this problem.

A honeybee shows the location of food to other bees by dancing a figure-eight pattern inside the hive. The imaginary line between the loops of the figure eight indicates the position of the food in relation to the sun, as shown below.

What is the measurement of the angle between the sun and the honeybee's food?





4

The honeybee must have a body temperature of at least 86° Fahrenheit (°F) to be able to fly. What is this temperature in Celsius? In the box below, provide the work that shows how you arrived at your answer.

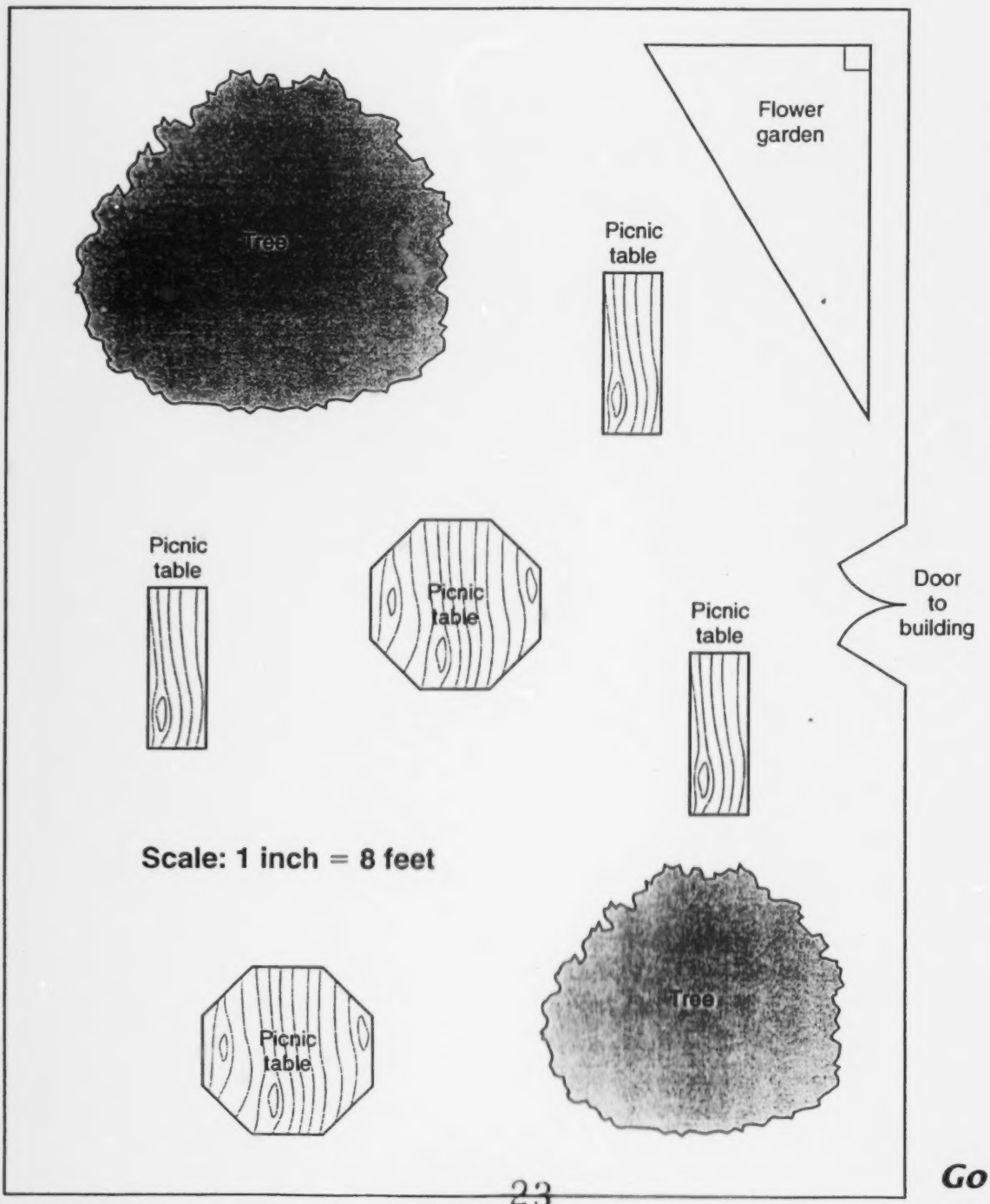
REF

22

School Lunch Yard

Directions

Numbers 5 through 7 are about creating an outside lunch yard at school. Show all of your work and write your answers directly in this booklet. Use the scale drawing to do Number 5.



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The eighth graders at your school decided to create a plan for an outdoor lunch yard where students could eat their lunch during nice weather. Before approaching the principal, the students made a scale drawing to help them present their idea.

5 Use your ruler to help you solve this problem.

The students thought it would be nice to include a flower garden in the lunch area. What is the ***actual*** area of the flower garden? In the box below, provide the work that shows how you arrived at your answer.

6 The students want to plant flowers in rows to fit the garden's shape. The first row will have 4 flowers, the second row will have 8 flowers, and the third row will have 12 flowers. If the pattern continues, how many flowers will be in the ***twelfth*** row? In the box below, provide the work that shows how you arrived at your answer.

7 The principal asked the eighth-grade students to research different kinds of garbage cans for garbage and recycling in the lunch yard. They found the following information.

GARBAGE CAN FACTS

	Garbage Can A	Garbage Can B
Shape	cylinder	rectangular prism
Dimensions	3 ft tall with 1 ft radius	2 ft × 2 ft × 2.5 ft
Capacity	30 gallons	34 gallons
Material Used	galvanized steel	plastic
Cost	$11.99	$13.99

The students will need enough garbage cans to collect 165 gallons of garbage and recycled goods per day in the lunch yard. Which garbage can should the students recommend? On the notebook page on Page 25, write a memo to the principal recommending which garbage can should be purchased for the lunch yard. Use mathematics to justify your decision.

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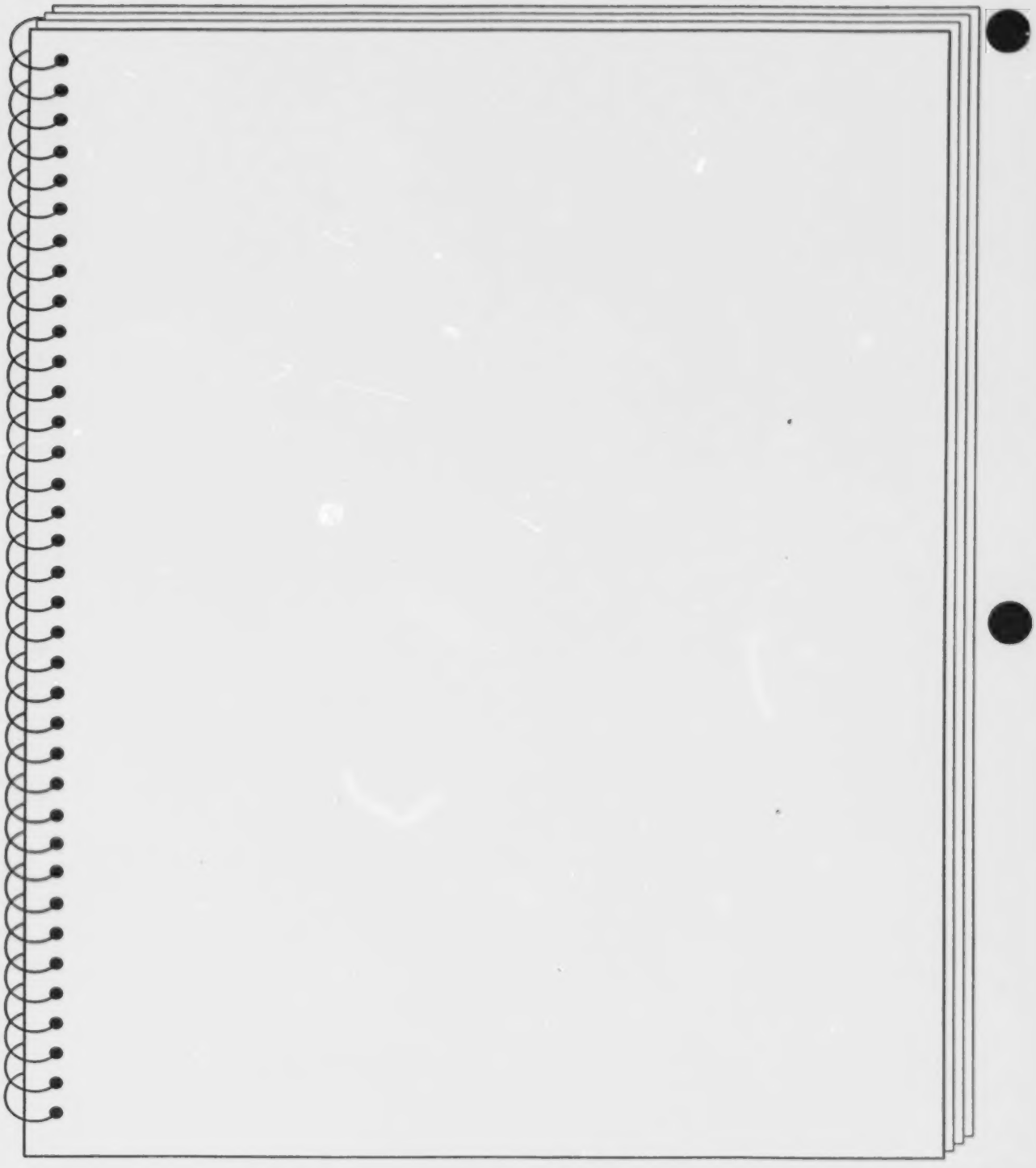

Directions

Numbers 8 through 10 are about a school skating night. Show all of your work and write your answers directly in this booklet.

8 The student council at your school wants to sponsor a family skating night at a local roller rink. The skating night is going to be a fundraiser to help purchase new sports equipment for the school. The students have discussed how to encourage ticket sales so that there will be a good turnout for the event.

They decide that each of the 5 student officers will call 5 eighth graders to tell them about the skating night. Each of those eighth graders will call 3 seventh graders. Assuming that no person is called more than once, how many seventh graders would be called? In the box below, provide the work that shows how you arrived at your answer.

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Items 9-10
Not Released

Scoring Guides

MISSOURI ASSESSMENT PROGRAM
MATHEMATICS SPRING 1998
SCORING GUIDE
GRADE 8

1. Students should not be penalized for omitting the following:

   - degree symbols
   - dollar signs ($) or cent signs (¢)
   - zeros for place holders; for example, either 0.75 or .750 could be used
   - labels for word problems; for example, "miles"

2. Students should not be penalized for:

   - spelling or grammar errors
   - using abbreviations; for example, ft or feet could be used
   - adding extra answer(s) as long as the answer(s) are correct and indicated as answer(s); however, if the extra answer(s) are incorrect, one point will be deducted.

3. Students should be given credit for:

   - answers not written on answer line; for example, answer could be given in work space or in explanation

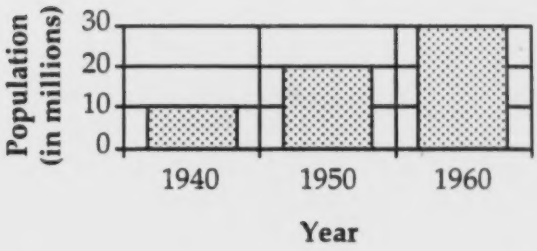
4. Graphs

   - The order in which the data in bar and circle graphs are graphed is NOT important.
   - Line graphs are acceptable with or without lines connecting the points.
   - Any width of a bar in a bar graph is acceptable.
   - Students should be given full credit for graphing extra data point(s) as long as the point(s) are reasonable.
   - Students should not be penalized for compressing the interval between 0 and the first increment as long as the other intervals are consistent.
   - Bar graphs can be horizontal or vertical; however, bars must originate at the axis representing the independent variable. (See attached.)

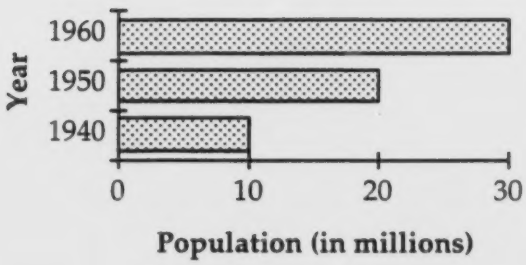
Condition Codes:

A. No response/refusal
B. Insufficient work to score
C. Off task
D. Illegible
E. Predominantly in another language

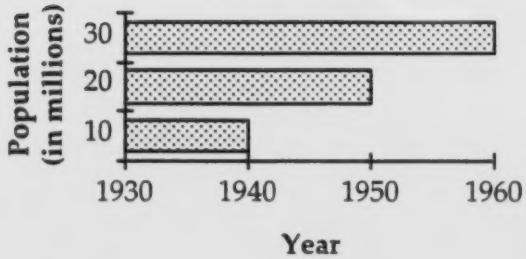
CORRECT



CORRECT



INCORRECT



MISSOURI ASSESSMENT PROGRAM
MATHEMATICS SPRING 1998
SHOW-ME STANDARDS

Goal 1

Students in Missouri public schools will acquire the knowledge and skills to gather, analyze, and apply information and ideas.

Students will demonstrate within and integrate across all content areas the ability to

1. develop questions and ideas to initiate and refine research
2. conduct research to answer questions and evaluate information and ideas
3. design and conduct field and laboratory investigations to study nature and society
4. use technological tools and other resources to locate, select, and organize information
5. comprehend and evaluate written, visual, and oral presentations and works
6. discover and evaluate patterns and relationships in information, ideas, and structures
7. evaluate the accuracy of information and the reliability of its sources
8. organize data, information, and ideas into useful forms (including charts, graphs, outlines) for analysis or presentation
9. identify, analyze, and compare the institutions, traditions, and art forms of past and present societies
10. apply acquired information, ideas, and skills to different contexts as students, workers, citizens, and consumers

Goal 2

Students in Missouri public schools will acquire the knowledge and skills to communicate effectively within and beyond the classroom.

Students will demonstrate within and integrate across all content areas the ability to

1. plan and make written, oral, and visual presentations for a variety of purposes and audiences
2. review and revise communications to improve accuracy and clarity
3. exchange information, questions, and ideas while recognizing the perspectives of others
4. present perceptions and ideas regarding works of the arts, humanities, and sciences
5. perform or produce works in the fine and practical areas
6. apply communication techniques to the job search and to the workplace
7. use technological tools to exchange information and ideas

MISSOURI ASSESSMENT PROGRAM
MATHEMATICS SPRING 1998
SHOW-ME STANDARDS

Goal 3

Students in Missouri public schools will acquire the knowledge and skills to recognize and solve problems.

Students will demonstrate within and integrate across all content areas the ability to

1. identify problems and define their scope and elements
2. develop and apply strategies based on ways others have prevented or solved problems
3. develop and apply strategies based on one's own experience in preventing or solving problems
4. evaluate the processes used in recognizing and solving problems
5. reason inductively from a set of specific facts and deductively from general premises
6. examine problems and proposed solutions from multiple perspectives
7. evaluate the extent to which a strategy addresses the problem
8. assess costs, benefits, and other consequences of proposed solutions

Goal 4

Students in Missouri public schools will acquire the knowledge and skills to make decisions and act as responsible members of society.

Students will demonstrate within and integrate across all content areas the ability to

1. explain reasoning and identify information used to support decisions
2. understand and apply the rights and responsibilities of citizenship in Missouri and the United States
3. analyze the duties and responsibilities of individuals in societies
4. recognize and practice honesty and integrity in academic work and in the workplace
5. develop, monitor, and revise plans of action to meet deadlines and accomplish goals
6. identify tasks that require a coordinated effort and work with others to complete those tasks
7. identify and apply practices that preserve and enhance the safety and health of self and others
8. explore, prepare for, and seek educational and job opportunities

Session: 1
Item: 1
Page: 3
Content Standard(s): 4 Patterns and Relationships
Process Standard(s): 1.10

Exemplary Response:

- ($) 20.90

AND

- $5n + 5.23 = 109.73$
  $5n = 109.73 - 5.23$
  $n = 104.50 \div 5$

  OR

  Other valid process

Score Points:

2 points	Exemplary Response
1 point	Correct process; error in computation
	OR
	Correct answer
0 points	Other

Scoring Comments:

Accept $21.95 as answer if student solves equation for $20.90, and adds tax of $1.05, with work shown.

Session: 1
Item: 2
Page: 4
Content Standard(s): 1 Number Sense
Process Standard(s): 1.10

Exemplary Response:

- $16\frac{1}{8}$ or 16.125 (yards)

AND

- $3\frac{5}{8} + 1\frac{3}{4} = \frac{29}{8} + \frac{14}{8} = \frac{43}{8}$
  $\frac{43}{8} \times 3 = \frac{129}{8}$
  $129 \div 8 = 16$ r 1

  OR

  Other valid process

Score Points:

2 points	Exemplary Response
1 point	Correct process, error in computation
	OR
	Correct answer
0 points	Other

Session: 1
Item: 3
Page: 5
Content Standard(s): 3 Data Analysis, Probability, and Statistics
Process Standard(s): 1.10

Exemplary Response:

- 133 (adults)

AND

- 120 + 136 +126 + 150 = 532
  532 ÷ 4

  OR

  Other valid process

Score Points:

2 points	Exemplary Response
1 point	Correct process, error in computation OR Correct answer OR Finds student mean (average) attendance (95); shows process OR Finds total (student and adult) mean (average) attendance (114); shows process
0 points	Other

Scoring Comments:

Student must show all parts of process to receive full credit.

Session: 1
Item: 4
Page: 7
Content Standard(s): 5 Mathematical Systems and Number Theory
Process Standard(s): 1.5

Exemplary Response:

- (Grade) 7

AND

- Grade 6 $11.7 + 14.75 + 12.8 = 39.25$
  Grade 7 $12.1 + 13.2 + 14 = 39.3$
  Grade 8 $8.3 + 17.4 + 13.5 = 39.2$

  OR

  Other valid process

Score Points:

2 points	Exemplary Response
1 point	Correct process; error in computation; error in comparing decimals OR Correct answer
0 points	Other

Session: 1
Item: 5
Page: 7
Content Standard(s): 1 Number Sense
Process Standard(s): 3.3

Exemplary Response:

- Procedure could be to compute the mean (average) of all the grades for the three weeks and then multiply this mean (average) by 10 weeks.

  OR

- Procedure could be to add up all the pounds of aluminum cans for all the grades for three weeks, divide by the number of numbers added (9), and then multiply by 10 weeks.

  OR

  Other valid procedure

Note: Can also show procedure by numeric process.

Score Points:

1 point	Exemplary Response
0 points	Other

Session: 1
Item: 6
Page: 8
Content Standard(s): 1 Number Sense
Process Standard(s): 3.1

Exemplary Response:

- 875

AND

- 175×5

OR

Other valid process

Score Points:

2 points	Exemplary Response
1 point	Correct process; error in computation
	OR
	Correct answer
0 points	Other

Session: 1
Item: 7
Page: 9
Content Standard(s): 1 Number Sense
Process Standard(s): 3.8

Exemplary Response:

- (Each person should buy) 1 one-day pass and 1 three-day pass

  OR

- (The family should buy) 4 one-day passes and 4 three-day passes

AND

- $4 \times 27.95 = (\$)\ 111.80$ (4 one-day passes)
  $80.95 + 27.95 = (\$)\ 108.90$ (a three-day pass and a one-day pass)

  OR

  Other valid process

Score Points:

2 points	Exemplary Response
1 point	Correct process; error in computation OR Correct answer OR Gives a pass combination that would work for 4 days but is not the cheapest (only for 4 one-day passes)
0 points	Other

Scoring Comments:

Students must show a comparison.

Session: 1
Item: 8
Page: 10
Content Standard(s): 3 Data Analysis, Probability, and Statistics
Process Standard(s): 3.5

Exemplary Response:

- Accept any answer in the range of $33 – $40

AND

- Explanation consistent with student work and equivalent to one of the following:

  The increases over the ten years average $1.70 every two years. This would indicate an increase of $8.50 (5 × $1.70) between 1995 and 2005. This would bring the cost to a total of $35.00 in 2005 ($8.50 + $26.50).

  OR

  The median increase is $1.50 every two years. I would multiply this by 5 because it is a ten-year projection. This would give me $7.50; this added to $26.50 would mean the cost would be $34.00.

  OR

  Other valid explanation

Score Points:

2 points	Exemplary Response
1 point	Correct prediction with no explanation OR Partial explanation that discusses the trends observed but draws no conclusion
0 points	Other

Scoring Comments:

Other valid explanations include:

Average $2 per 2 years or $10 + $26.50 = $36.50.

Session: 1
Item: 9
Page: 11
Content Standard(s): 6 Discrete Mathematics
Process Standard(s): 1.6

Exemplary Response:

- 15 (combinations)

AND

- 3×5

  OR

  Other valid method of finding all the combinations

Score Points:

2 points	Exemplary Response
1 point	Correct process; error in computation OR Correct answer
0 points	Other

Scoring Comments:

Students may show combinations.

Session: 1
Item: 10
Page: 13–15
Content Standard(s): 3 Data Analysis, Probability, and Statistics
Process Standard(s): 3.5

Score Points:

4 points

The student's response fully addresses the performance event.

The response:

- demonstrates knowledge of the mathematical concepts and principles needed to complete the event.
- communicates all process components that lead to an appropriate and systematic solution.
- may have only minor flaws with no effect on the reasonableness of the solution.

3 points

The student's response substantially addresses the performance event.

The response:

- demonstrates knowledge of the mathematical concepts and principles needed to complete the event.
- communicates most process components that lead to an appropriate and systematic solution.
- may have only minor flaws with minimal effect on the reasonableness of the solution.

2 points

The student's response partially addresses the performance event.

The response:

- demonstrates a limited knowledge of the mathematical concepts and principles needed to complete the event.
- communicates some process components that lead to an appropriate and systematic solution.
- may have flaws or extraneous information that indicates some lack of understanding or confusion.

Session: 1
Item: 10
Page: 13–15
Content Standard(s): 3 Data Analysis, Probability, and Statistics
Process Standard(s): 3.5

1 point

The student's response minimally addresses the performance event.

The response:

- demonstrates a limited knowledge of the mathematical concepts and principles needed to complete the event.
- communicates few or no process components that lead to an appropriate and systematic solution.
- may have flaws or extraneous information that indicates lack of understanding or confusion.

0 points

Other—Responses not addressed by the Condition Codes:

Examples of "0":

Work consists of copying the prompt information only.
Work indicates no mathematical understanding of the task.

Session: 1
Item: 10
Page: 13–15
Content Standard(s): 3 Data Analysis, Probability, and Statistics
Process Standard(s): 3.5

Sample Solution:

Name of Fish/Plant	Number Purchased	Cost per Item (in dollars)	Total Cost (in dollars)	Length of Fish (in inches)	Total Length (in inches)
Elodea	2	0.75	1.50		
Fan Plant	1	1.95	1.95		
Wisteria	2	2.95	5.90		
Sword Plant	2	5.95	11.90		
Angelfish	2	8.95	17.90	3	6
Catfish	1	1.95	1.95	1	1
Clown Barb	2	1.45	2.90	1.25	2.5
Clown Loach	1	5.95	5.95	3	3
Gourami	2	3.95	7.90	2.5	5
Mollie	2	2.45	4.90	1.5	3
Platy	2	0.95	1.90	1.5	3
Neon Tetra	4	1.25	5.00	0.75	3
Guppy	8	0.35	2.80	1	8
Totals			72.45		34.5

OR

Other valid table that shows the following:

- The total cost is between $65 and $75.
- The total length of the fish when combined is less than or equal to 35 inches.
- The number of plants purchased must be at least 2 and the total number of plants should not exceed 10.
- The number of kinds of fish purchased must be at least 5.

Note: Accept totals that are not included in the table.

Session: 2
Item: 1
Page: 18
Content Standard(s): 5 Mathematical Systems and Number Theory
Process Standard(s): 3.3

Score Points:

4 points

The student's response fully addresses the performance event.

The response:

- demonstrates knowledge of the mathematical concepts and principles needed to complete the event.
- communicates all process components that lead to an appropriate and systematic solution.
- may have only minor flaws with no effect on the reasonableness of the solution.

3 points

The student's response substantially addresses the performance event.

The response:

- demonstrates knowledge of the mathematical concepts and principles needed to complete the event.
- communicates most process components that lead to an appropriate and systematic solution.
- may have only minor flaws with minimal effect on the reasonableness of the solution.

2 points

The student's response partially addresses the performance event.

The response:

- demonstrates a limited knowledge of the mathematical concepts and principles needed to complete the event.
- communicates some process components that lead to an appropriate and systematic solution.
- may have flaws or extraneous information that indicates some lack of understanding or confusion.

Session: 2
Item: 1
Page: 18
Content Standard(s): 5 Mathematical Systems and Number Theory
Process Standard(s): 3.3

1 point	The student's response minimally addresses the performance event. The response: • demonstrates a limited knowledge of the mathematical concepts and principles needed to complete the event. • communicates few or no process components that lead to an appropriate and systematic solution. • may have flaws or extraneous information that indicates lack of understanding or confusion.
0 points	Other—Responses not addressed by the Condition Codes: Examples of "0": Work consists of copying the prompt information only. Work indicates no mathematical understanding of the task.

Session: 2
Item: 1
Page: 18
Content Standard(s): 5 Mathematical Systems and Number Theory
Process Standard(s): 3.3

Sample Solution:

119 (students marched in parade)

Lists multiples of 7 through 126

7, 14, 21, 28, 35, 42, 49, 56, 63, 70, 77, 84, 91, 98, 105, 112, 119, 126

Determines which multiple meets the requirement of one student short in each row (remainder of 3 for 4; remainder of 4 for 5; remainder of 5 for 6)
(Using the remainder rather than a decimal conveys the understanding that each of the final rows would be short by 1 student.)

$119 \div 6 = 19$ r 5 $\quad 119 \div 5 = 23$ r 4 $\quad 119 \div 4 = 29$ r 3

OR

Other valid process

Note: Student must communicate process to receive full credit.

Scoring Comments:

Student must show where 119 comes from. If student only gives answer of 119, should receive 1 point.

Session: 2
Item: 2
Page: 19
Content Standard(s): 2 Geometric/Spatial Sense and Measurement
Process Standard(s): 3.1

Exemplary Response:

- 2,400 (cells)

AND

- $8 \times 12 = 96$ (square inches)
  96×25

  OR

  Other valid process

Score Points:

2 points	Exemplary Response
1 point	Correct process; error in computation
	OR
	Correct answer
	OR
	Correct area with process shown
0 points	Other

Scoring Comments:

$8 \times 12 = 96$
$96 \times 25 = 2400$ receives 2 points.

Session: 2
Item: 3
Page: 20
Content Standard(s): 2 Geometric/Spatial Sense and Measurement
Process Standard(s): 1.4

Exemplary Response:

- Accept angle measure in the range of 33° to 37°.

Score Points:

1 point	Exemplary Response
0 points	Other

Session: 2
Item: 4
Page: 21
Content Standard(s): 4 Patterns and Relationships
Process Standard(s): 1.4

Exemplary Response:

- A temperature within the range of 29.9 (°C) to 32.4 (°C)

AND

- $C = \frac{5}{9}(86 - 32)$
  $C = \frac{5}{9}(54)$
  $C = 5(6)$

  OR

  Other valid process

Score Points:

2 points	Exemplary Response
1 point	Correct process; error in computation
	OR
	Correct answer
0 points	Other

Session: 2
Item: 5
Page: 23
Content Standard(s): 2 Geometric/Spatial Sense and Measurement
Process Standard(s): 3.1

Exemplary Response:

- 120 (square feet)

AND

- $\frac{1 \text{ in}}{8 \text{ ft}} = \frac{1.5 \text{ in}}{x \text{ ft}}$
  $x = 12$ feet

  $\frac{1 \text{ in}}{8 \text{ ft}} = \frac{2.5 \text{ in}}{y \text{ ft}}$
  $y = 20$ feet

  OR

  Other valid process for converting measurements

AND

- $\frac{1}{2} \times 12 \times 20$

  OR

  Other valid process for finding area

Note: As long as 12 and 20 appear on the page the student has satisfied the conversion process.

Session: 2
Item: 5
Page: 23
Content Standard(s): 2 Geometric/Spatial Sense and Measurement
Process Standard(s): 3.1

Score Points:

3 points	Exemplary Response
2 points	Correct processes; error in computation/labeling
1 point	One correct process shown with correct answer for that process OR Correct answer
0 points	Other

Scoring Comments:

Must convert to feet.

Session: 2
Item: 6
Page: 23
Content Standard(s): 4 Patterns and Relationships
Process Standard(s): 1.6

Exemplary Response:

- 48 (flowers)

AND

- Constructs table to find answer

Row	Flowers	Row	Flowers
1	4	7	28
2	8	8	32
3	12	9	36
4	16	10	40
5	20	11	44
6	24	12	48

OR

$1 \times 4 = 4$
$2 \times 4 = 8$
$3 \times 4 = 12$
$12 \times 4 = 48$

OR

Other valid process

Score Points:

2 points	Exemplary Response
1 point	Correct process; error in computation
	OR
	Correct answer
0 points	Other

Session: 2
Item: 7
Page: 24–25
Content Standard(s): 3 Data Analysis, Probability, and Statistics
Process Standard(s): 4.1

Exemplary Response:

- Recommends garbage can B because it holds more garbage and will cost less

AND

- Justification includes the following:

  Would need 6 of trash can A (165 ÷ 30 = 5.5 or 6)

  Would need 5 of trash can B (165 ÷ 34 = 4.9 or 5)

  Cost to purchase A (6 × $11.99 = $71.94) is higher than the cost to purchase B (5 × $13.99 = 69.95)

Score Points:

3 points	Exemplary Response
2 points	Correct recommendation with only partial justification OR Correct process shown in justification; error in computation causes wrong recommendation
1 point	Correct recommendation OR Partial justification with wrong recommendation
0 points	Other

Session: 2
Item: 7
Page: 24–25
Content Standard(s): 3 Data Analysis, Probability, and Statistics
Process Standard(s): 4.1

Scoring Comments:

Examples of partial justification:

1. 6 cans of A
   5 cans of B

2. $71.94 is cost of A
   $69.95 is cost of B

3. 6 cans of A cost $71.94

4. 5 cans of B cost $69.95

Session: 2
Item: 8
Page: 26
Content Standard(s): 6 Discrete Mathematics
Process Standard(s): 1.6

Exemplary Response:

- 75 (seventh graders)

AND

- $5 \times 5 \times 3$

OR

Other valid method of finding all of the possibilities

Score Points:

2 points	Exemplary Response
1 point	Correct process; error in computation OR Correct answer
0 points	Other

Anchor Papers

Glee Club

SCORE 2

Directions

Numbers 7 through 10 are about a school Glee Club preparing for its winter concert. Show all of your work and write your answers directly in this booklet.

1 In preparing for their winter concert, the Glee Club purchased 5 gallons of paint to create a backdrop for the stage. The total bill for the paint was $109.73, including $5.23 sales tax. The club's sponsor wants to know the cost of *one* gallon of paint.

To find the cost of one gallon of paint, solve the equation $5n + \$5.23 = \$109.73$, where n represents 1 gallon of paint. In the box below, provide the work that shows how you arrived at your answer.

$5n + \$5.23 = 109.73$
$-5.23 \quad -5.23$
$\frac{5n}{5} = \frac{104.50}{5}$

Correct process

$5\overline{)104.50}$ = 20.90
$\frac{0}{0\,45}$
$\frac{45}{00}$

$n = \$20.90$

Correct answer

Exemplary Response

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Glee Club

SCORE 1

Directions

Numbers 7 through 10 are about a school Glee Club preparing for its winter concert. Show all of your work and write your answers directly in this booklet.

1 In preparing for their winter concert, the Glee Club purchased 5 gallons of paint to create a backdrop for the stage. The total bill for the paint was $109.73, including $5.23 sales tax. The club's sponsor wants to know the cost of *one* gallon of paint.

To find the cost of one gallon of paint, solve the equation $5n + \$5.23 = \$109.73$, where n represents 1 gallon of paint. In the box below, provide the work that shows how you arrived at your answer.

$5n + 5.23 = 109.73$

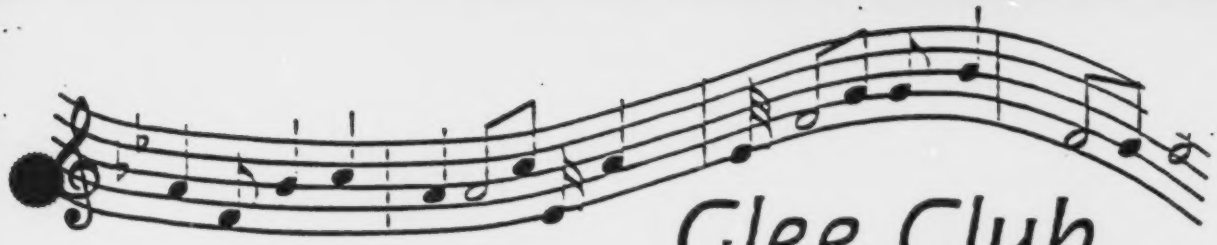
$-5.23 \quad -5.23$

$\frac{1}{5}\frac{5n}{1} = 104.5 \times \frac{1}{5}$

$n = \$21.84$

Correct process

Error in computation gives wrong answer



Glee Club

SCORE 0

Directions

Numbers 7 through 10 are about a school Glee Club preparing for its winter concert. Show all of your work and write your answers directly in this booklet.

L

In preparing for their winter concert, the Glee Club purchased 5 gallons of paint to create a backdrop for the stage. The total bill for the paint was $109.73, including $5.23 sales tax. The club's sponsor wants to know the cost of *one* gallon of paint.

To find the cost of one gallon of paint, solve the equation $5n + \$5.23 = \$109.73$, where n represents 1 gallon of paint. In the box below, provide the work that shows how you arrived at your answer.

109.73
+5.23
114.96
1/5
22.992 rounded to 23

23

Incorrect answer

Incorrect process added instead of subtracted

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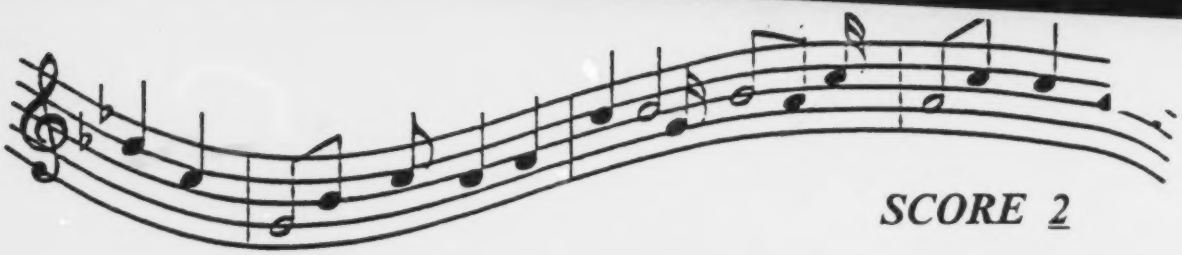

SCORE 2

Janette, Carla, and Milo are performing a special number in costume during the concert. Each of their costumes will require $3\frac{5}{8}$ yards of material for the outfit and another $1\frac{3}{4}$ yards of material for the hat.

How much material is needed in all for the 3 complete costumes? In the box below, provide the work that shows how you arrived at your answer.

$$\begin{array}{r} 3.625 \\ +\ 1.75 \\ \hline 5.375 \text{ (per person)} \\ \times\quad 3 \\ \hline 16.125 \text{ (all togeither)} \end{array}$$

Correct process

Correct answer

Exemplary Response

BEST COPY AVAILABLE

SCORE 1

2 Janette, Carla, and Milo are performing a special number in costume during the concert. Each of their costumes will require $3\frac{5}{8}$ yards of material for the outfit and another $1\frac{3}{4}$ yards of material for the hat.

How much material is needed in all for the 3 complete costumes? In the box below, provide the work that shows how you arrived at your answer.

$\frac{3}{1} \times 29/8 = 87/8 = 10.875$

Correct process

$3/1 \times 7/4 = 21/4 = 5.25$

Error in computation gives wrong answer– didn't carry the 1 from 7 + 5

$$\begin{array}{r} 10.875 \\ 5.25 \\ \hline 16.025 \text{ yards} \end{array}$$

157066

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Go On

SCORE 0

2

Janette, Carla, and Milo are performing a special number in costume during the concert. Each of their costumes will require $3\frac{5}{8}$ yards of material for the outfit and another $1\frac{3}{4}$ yards of material for the hat.

How much material is needed in all for the 3 complete costumes? In the box below, provide the work that shows how you arrived at your answer.

$12\frac{5}{8}$

$3\frac{5}{8} \times 3$ people $+ 1\frac{3}{4}$ for hat

Incorrect answer

Incorrect process—multiplied 3 5/8 by 3 and then added 1 3/4, when they should have added 3 5/8 to 1 3/4 and then multiplied by 3

BEST COPY AVAILABLE

Directions

Use the information in the chart below to do Numbers 9 and 10.

The Glee Club kept track of the attendance at each of their 4 performances. At the end of the 4 performances, they had the following information:

ATTENDANCE PER PERFORMANCE

Performance	Student	Adult
1	75	120
2	95	136
3	110	126
4	100	150

SCORE 2

What was the adult mean (average) attendance at the concerts? In the box below, provide the work that shows how you arrived at your answer.

120 + 136 + 126 + 150 532 ÷ 4

Correct process

133 *Correct answer*

Exemplary Response

BEST COPY AVAILABLE

Directions

Use the information in the chart below to do Numbers 9 and 10.

3 The Glee Club kept track of the attendance at each of their 4 performances. At the end of the 4 performances, they had the following information:

ATTENDANCE PER PERFORMANCE

Performance	Student	Adult
1	75	120
2	95	136
3	110	126
4	100	150

SCORE 1

What was the adult mean (average) attendance at the concerts? In the box below, provide the work that shows how you arrived at your answer.

120 + 136 + 126 + 150 = 788
+3 2 3 4

788 ÷ 4 =

197

Correct process

Error in computation gives wrong answer —added 4 adult performances up to 788 instead of 532, which lead to the wrong answer when they divided by 4

BEST COPY AVAILABLE

Directions

Use the information in the chart below to do Numbers 9 and 10.

The Glee Club kept track of the attendance at each of their 4 performances. At the end of the 4 performances, they had the following information:

ATTENDANCE PER PERFORMANCE

Performance	Student	Adult
1	75	120
2	95	136
3	110	126
4	100	150

SCORE 0

What was the adult mean (average) attendance at the concerts? In the box below, provide the work that shows how you arrived at your answer.

130 It is a # that is in between each of the numbers.

Incorrect answer

No process shown

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4 Which grade collected the ***greatest*** number of pounds of aluminum cans during the 3-week period? In the box below, provide the work that shows how you arrived at your answer.

Correct process

SCORE 2

Grd 6	Grd 7	Grd 8
11.7	12.1	8.3
14.75	13.2	17.4
12.8	14.0	13.5
39.25	39.30	39.20

Grade 7 *Correct answer*

Session 1

Exemplary Response

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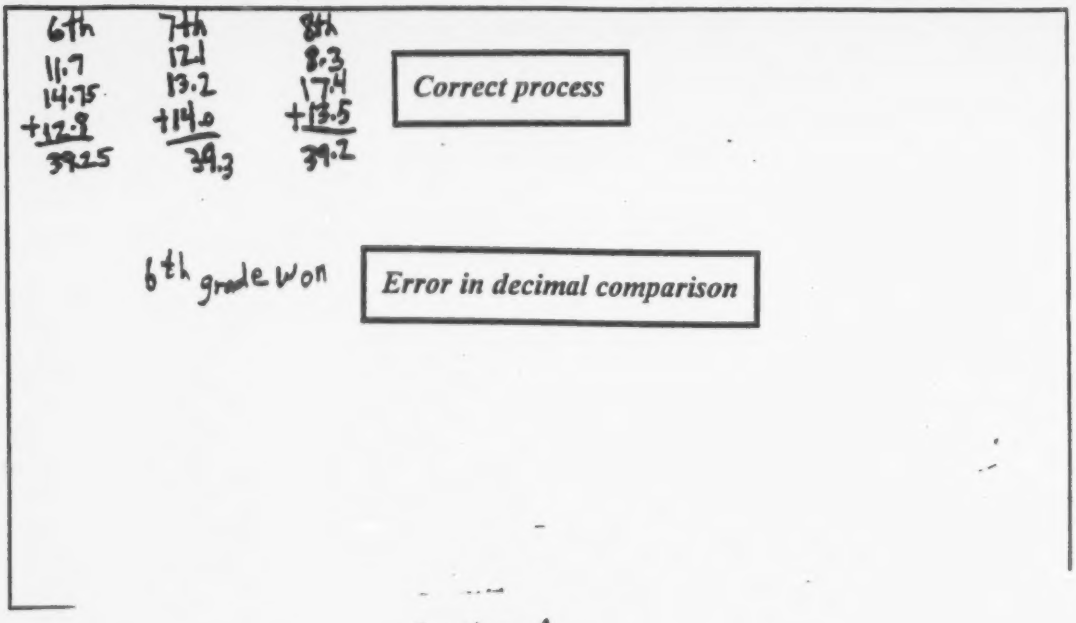
4 Which grade collected the *greatest* number of pounds of aluminum cans during the 3-week period? In the box below, provide the work that shows how you arrived at your answer.

SCORE 1



Session 1

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178758

11

4 Which grade collected the *greatest* number of pounds of aluminum cans during the 3-week period? In the box below, provide the work that shows how you arrived at your answer.

SCORE 0

Incorrect answer

8th grade collected the greatest number.

13.5 aluminum cans
+293 newspapers
306.5

Incorrect process--adds aluminum cans to newspapers, no understanding of task

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5 What procedure could you follow to estimate the total number of pounds of aluminum cans collected by *all* of the grades at the end of a 10-week period?

SCORE 1

average each grade then multiply that by 10 then add each grades totals together

130.9
131.0
+130.7
392.6

13.09
x 10

3 | 39.25
-3
09
-9
25
-24
10

3 | 39.3

13.07
3 | 39.2
-3
09
-9
20
18

rocedure could be to compute the mean (average) f all the grades for the three weeks and then multiply :is mean (average) by 10 weeks

Session 1

Exemplary Response

BEST COPY AVAILABLE

5 What procedure could you follow ~~to estimate the~~ total number of pounds of aluminum cans collected by *all* of ~~the~~ grades ~~at the~~ end of a 10-week period?

Take week 2's productivity and multiply it times 5.

SCORE 0

Incorrect answer—no understanding of procedure

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6 Your class has decided to crush the cans to save space. A full-size can is 5 inches tall, while a crushed can is 1 inch tall. If 175 full-size cans will fit into a garbage bag, about how many crushed cans will fit into the same bag? In the box below, provide the work that shows how you arrived at your answer.

SCORE 2

$$\begin{array}{r} 175 \\ \times \quad 5 \\ \hline \end{array}$$

Correct process

875 CANS will fit

Correct answer

Exemplary Response

BEST COPY AVAILABLE

6 Your class has decided to crush the cans to save space. A full-size can is 5 inches tall, while a crushed can is 1 inch tall. If 175 full-size cans will fit into a garbage bag, about how many crushed cans will fit into the same bag? In the box below, provide the work that shows how you arrived at your answer.

SCORE 1

875 *Correct answer*

No process shown

BEST COPY AVAILABLE

6 Your class has decided to crush the cans to save space. A full-size can is 5 inches tall, while a crushed can is 1 inch tall. If 175 full-size cans will fit into a garbage bag, about how many crushed cans will fit into the same bag? In the box below, provide the work that shows how you arrived at your answer.

SCORE 0

Incorrect process—incorrect numbers used

175
x 4
700 cans

Incorrect answer

Session 1

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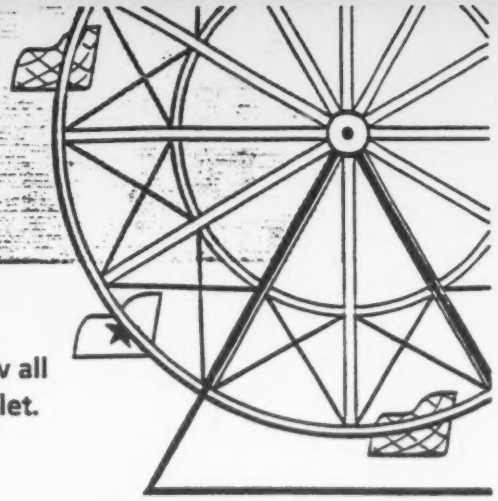
AMUSEMENT PARK



Directions

Numbers 1 through 5 are about an amusement park. Show all of your work and write your answers directly in this booklet.

7 A family of four wants to spend 4 days at the Fun Land amusement park. There are three options for purchasing individual entrance passes for Fun Land. The table below shows the prices for the different options.

family of 4 4days

PASS PRICES

Type of Pass	Price
One-day	$27.95
Three-day	$80.95
Five-day	$134.95

Which pass or combination of passes will be the *least* expensive for a family of four to purchase during their stay at Fun Land amusement park? In the box below, provide the work that shows how you arrived at your answer.

SCORE 2

Correct process

27.95 + 80.95 = 108.90 × 4 = 435.60

134.95 × 4 = 539.80

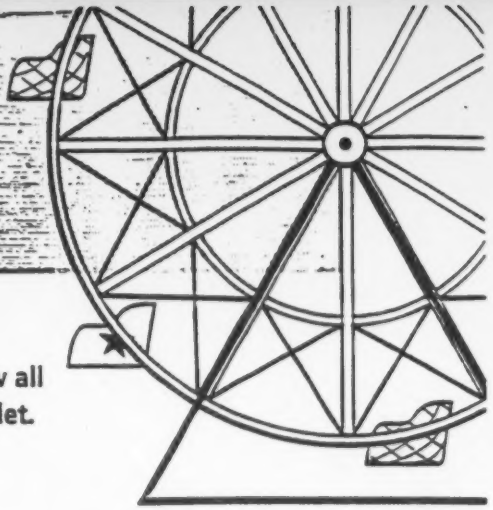
27.95 × 4 = 111.80 × 4 = 447.02

Correct answer

Purchase 4 one-day passes and 4 three-day passes

Exemplary Response

AMUSEMENT PARK



Directions

Numbers 1 through 5 are about an amusement park. Show all of your work and write your answers directly in this booklet.

7 A family of four wants to spend 4 days at the Fun Land amusement park. There are three options for purchasing individual entrance passes for Fun Land. The table below shows the prices for the different options.

SCORE 1

PASS PRICES

Type of Pass	Price
One-day	$27.95
Three-day	$80.95
Five-day	$134.95

Which pass or combination of passes will be the *least* expensive for a family of four to purchase during their stay at Fun Land amusement park? In the box below, provide the work that shows how you arrived at your answer.

Buy 1 one day pass
and 1 Three day pass

Correct answer

27.95+80.95=108.90

Partial process—shows work to get the 1 one-day pass and the 1 three-day pass

The response fails to Show a comparison

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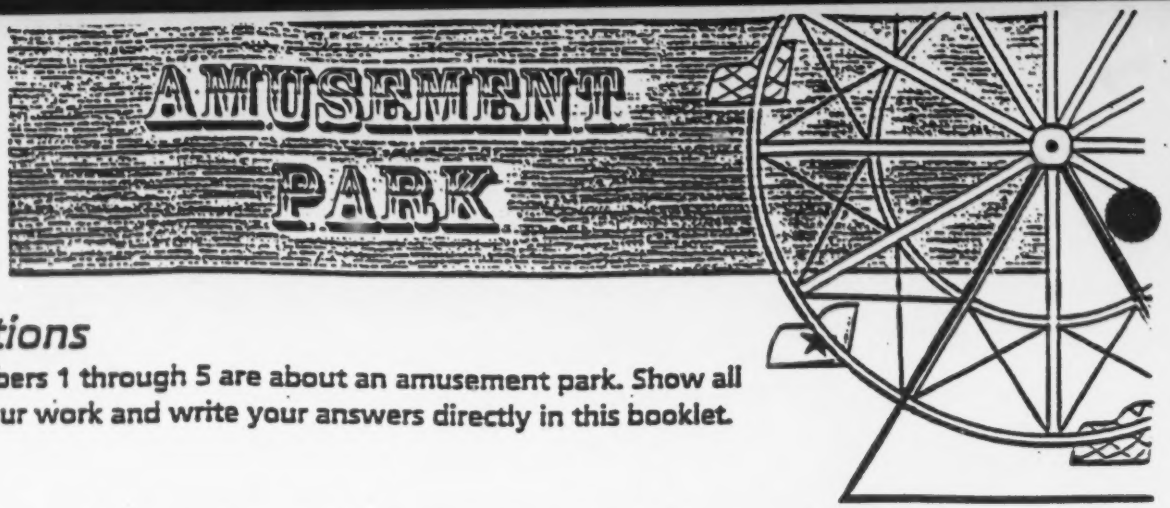

Directions

Numbers 1 through 5 are about an amusement park. Show all of your work and write your answers directly in this booklet.

7 A family of four wants to spend 4 days at the Fun Land amusement park. There are three options for purchasing individual entrance passes for Fun Land. The table below shows the prices for the different options.

PASS PRICES

Type of Pass	Price
One-day	$27.95
Three-day	$80.95
Five-day	$134.95

SCORE 0

Which pass or combination of passes will be the *least* expensive for a family of four to purchase during their stay at Fun Land amusement park? In the box below, provide the work that shows how you arrived at your answer.

The three-day
$134.95
$80.95
$54 apiece

Incorrect process

Incorrect answer

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8

Use the information in the table on Page 4 to complete this problem. If the trend in the cost of passes continues, what do you predict would be the cost of a one-day pass in the year 2005? In the box below, explain how you arrived at your answer.

SCORE 2

1997	$28.00
1999	$30.50
2001	$32.00
2003	$33.50
2005	$35.50

Correct answer—Answer in the range of $30 - $40 ($35.50)

Add $1.50 then $2.50 then $1.50 then $1.50 then $2.00

Correct explanation

Exemplary Response

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8 Use the information in the table on Page 4 to complete this problem. If the trend in the cost of passes continues, what do you predict would be the cost of a one-day pass in the year 2005? In the box below, explain how you arrived at your answer.

SCORE 1

I think it will be 34 because I just repeated the process on the chart.

Correct prediction with no explanation– answer in the range of $30 - $40

Session 1

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142980

8

Use the information in the table on Page 4 to complete this problem. If the trend in the cost of passes continues, what do you predict would be the cost of a one-day pass in the year 2005? In the box below, explain how you arrived at your answer.

SCORE 0

96 - 28.50 4
97 - 31.50 4½
98 - 35.50 5
99 - 39.50 5½
2000 - 44.50 6
2001 - 50.50 6
2002 - 56.50 6½
2003 - 63.50 7
2004 - 70.50 7½
2005 - 78 00 8

Incorrect explanation

It would be $ 78,00 because you add half every time

Incorrect prediction– not in the range of $30 - $40

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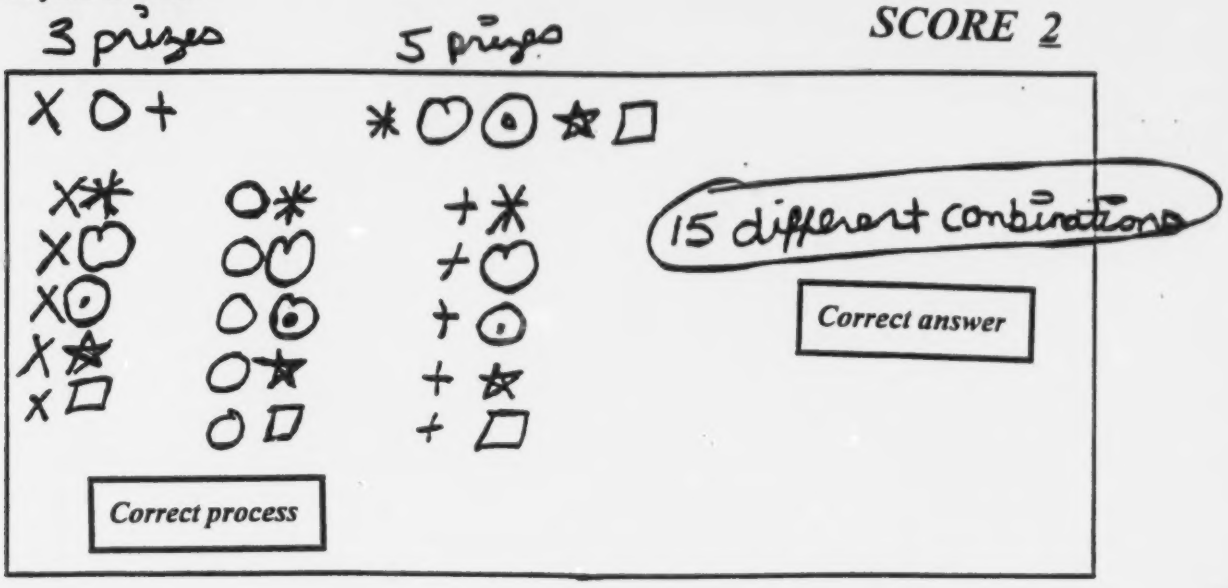
9 Fun Land has two very popular games on the midway. One of the games has 3 different prizes you can win and the other game has 5 different prizes. How many different combinations of one prize from each game could a player win? In the box below, provide the work that shows how you arrived at your answer.

SCORE 2



Exemplary Response

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9 Fun Land has two very popular games on the midway. One of the games has 3 different prizes you can win and the other game has 5 different prizes. How many different combinations of one prize from each game could a player win? In the box below, provide the work that shows how you arrived at your answer.

SCORE 1

there are 15 different combinations

Correct answer

No process shown

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9 Fun Land has two very popular games on the midway. One of the games has 3 different prizes you can win and the other game has 5 different prizes. How many different combinations of one prize from each game could a player win? In the box below, provide the work that shows how you arrived at your answer.

SCORE 0

$$\begin{array}{r} 3 \\ +5 \\ \hline 8 \end{array}$$

it would be 8

Incorrect process— added instead of multiplied

Incorrect answer

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SCORE 4

quantity	Fish	Length	cost
3	Angelfish	3 in each. 9 in total	$8.95 each $26.85 total
3	Clownbarb	1¼ in each 3¾ in total	$1.45 each $4.35 total
2	Gourami	2½ in each 5 in total	$3.95 each $7.90 total
4	Mollie	1½ in. each 6 in. total	$2.45 each $9.80 total
3	Neon Tetra	¾ in. each 2¼ in. total	$1.25 each $3.75 total
15		26 in total	$52.65 total
	Plants		
1	Fan Plant	6 in each 6 in. total	$1.95 each $1.95 total
2	Sword Plant	12 in each 24 in total	$5.95 each $11.90 total

26 in
52.65

5 kinds of fish
2 kinds of plants
26 in. of fish total
total cost is $66.50

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MISSOURI MATH
FORM B
GRADE 8

ITEM 10/ SESSION 1	*ANCHOR*	*SCORE POINT 4*

Student's response fully addresses the performance event
Effectively communicates all steps of the solution

- *The total cost is between $65 and $75*
- *The number of plants purchased was at least 2 and did not exceed 10*
- *The number of kinds of fish purchased was at least 5*
- *Gives the total length of the fish--Extra information with respect to giving inches of plants does not effect the reasonableness of the solution*
- *Puts it into a table*

Budget "65 to "75 must not exceed
5 kinds of fish 35 must not exceed 10
2 kinds of plants not exceed

10

SCORE 3

Name	Cost	Length (in)	Total
Fish			
Angelfish	$8.95	3	$8.95
ClownLoach	$5.95	3	$5.95
Redtail Shark	$5.95	3	$5.95
Gourami	$3.95	$2\frac{1}{2}$	$3.95
Silver Hatchets	$2.95	$\frac{3}{4}$	$2.95
			27.75
Plants		# of plants	
Sword Plant	$5.95 • 7	12	$ 41.65
Wisteria	$2.95 • 1	12	$ 2.95
		Grand Total =	$72.35 Go!

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MISSOURI MATH
FORM B
GRADE 8

ITEM 10/ SESSION 1	*ANCHOR*	*SCORE POINT 3*

Student's response substantially addresses the performance event

Communicates most steps of the solution

- *The total cost is between $65 and $75*
- *The number of plants purchased was at least 2 and did not exceed 10*
- *The number of kinds of fish purchased was at least 5*
- *Puts it into a table*

The response fails to

- *Give total length of the fish*

88

30

10

SCORE 2

Fish:

4 algae eaters → 5.80
3 guppies → 1.05
2 Angelfish → 17.90
1 Catfish → 1.95
1 Clown Barb → 1.45
2 Red Tailed Sharks → 11.90

Plants:

2 Fan Plants → 3.90
4 Elodea → 3.00
1 Wisteria → 2.95
3 Sword Plants → 17.85

$40.05 fish
$27.70 plants
$67.75 total

Session 1

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MISSOURI MATH
FORM B
GRADE 8

ITEM 10/ SESSION 1	*ANCHOR*	*SCORE POINT 2*

Student's response partially addresses the performance event

Communicates some steps of the solution

- *The total cost is between $65 and $75*
- *The number of plants purchased was at least 2 and did not exceed 10*
- *The number of kinds of fish purchased was at least 5*

The response fails to

- *Give the total length of the fish*
- ~~*Does not put the information in the form of a table*~~
  Does not put the information into a complete organized way. (Have to infer what columns mean)

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10

SCORE 2

	Name	Cost	Length
	Red tail shark	$5.95	3
	Platy	.95	1 1/2
	Guppy	.35	1
	Algae Eater	1.45	1
	Neon Tetra	1.25	3/4
Plants	Elodea	.75	8
Plants	Fan Plant	1.95	6
Plants	Wisteria	2.95	12
	Total	$15.60	7 1/4 in.

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Section 1

MISSOURI MATH
FORM B
GRADE 8

ITEM 10/ SESSION 1	*ANCHOR*	*SCORE POINT 2*

Student's response partially addresses the performance event

Communicates some steps of the solution

- *The number of plants purchased was at least 2 and did not exceed 10*
- *The number of kinds of fish purchased was at least 5*
- *Puts it into a table*

The response fails to

- *Stay in the range of $65 and $75*
- *Did not use more than one of any fish--lack of statistical understanding*

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4. 5 word Plant $5.95 × 4 = 23.80

3. Redtail sharks 5.95 × 3 = 17.85

2. Platy .95 × 2 = 1.90

3. Angelfish 8.95 × 3 = 26.85

23.80 + 17.85 = 41.65

41.65 + 1.90 = 43.55

43.55 + 26.85 = 70.40

SCORE 1

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MISSOURI MATH
FORM B
GRADE 8

ITEM 10/ SESSION 1	*ANCHOR*	*SCORE POINT 1*

Student's response minimally addresses the performance event
Communicates few steps of the solution

- *The total cost is between $65 and $75*

The response fails to

- *Give the total length of the fish*
- *Does not purchase at least 2 plants*
- *Does not purchase at least 5 kinds of fish*
- *Does not put the information in the form of a table*

BEST COPY AVAILABLE

10

Angelfish $8.95
Cat fish $1.95
Neon tetra $1.25
Redtail Shark $5.95
Silver Hatchies $2.95

Sword Plant $5.95
Fan Plant $2.95

SCORE 0

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MISSOURI MATH
FORM B
GRADE 8

ITEM 10/ SESSION 1	*ANCHOR*	*SCORE POINT 0*

Other--Work indicates no mathematical understanding of the task

- *The number of plants purchased was at least 2 and did not exceed 10*
- *The number of kinds of fish purchased was at least 5*

The response failed to

- *Does not give a total cost*
- *Does not give the total length of the fish*
- *Does not put the information in the form of a table*

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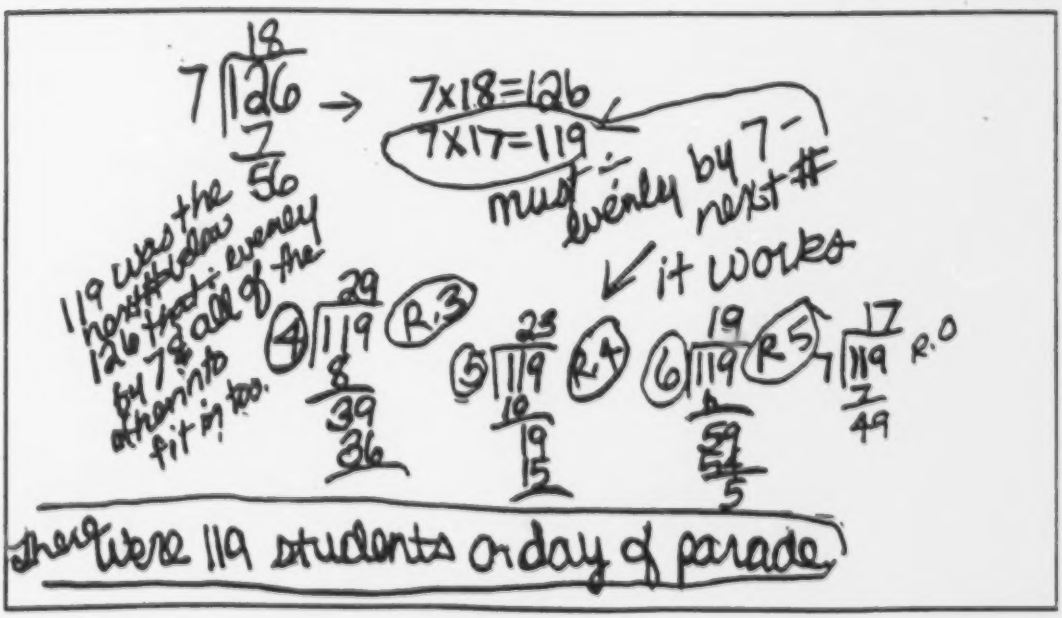
Directions

Show all of your work and write your answers directly in this booklet. *SCORE 4*

1 Your local high school marching band is marching in today's state fair parade. The band, composed of 126 students, usually marches in 21 rows of 6 students each. Due to illness, several band members are unable to march in today's parade.

As drum major, you must assist the band director in rearranging the students into rows of equal numbers of students. When you tried 4 students in each row, the last row was 1 student short. The results were the same when rows of 5 and 6 students were arranged. When you arranged the band into rows of 7 students, all rows were complete.

Use the above information to determine how many students showed up to march in the parade. In the box below, explain how you found the number of students that were present on the day of the parade.



175443

MISSOURI MATH
FORM B
GRADE 8

ITEM 1/ SESSION 2	*ANCHOR*	*SCORE POINT 4*

Student's response fully addresses the performance event
Effectively communicates all steps of the solution

- *Determines which multiple meets the requirement of one student short in each row (119 ÷ 4 = 31 r2, 119 ÷ 5 = 23 r4, 119 ÷ 6 = 19 r5)*
- *Gives a multiple of 7 (126 ÷ 7 = 18)*
- *Shows how they arrived at 119 (126 - 7 = 119)*
- *Student clearly communicates process--119 was the next # below 126 that = evenly by 7 and all of the other into fit in too*

98

40

SCORE 3

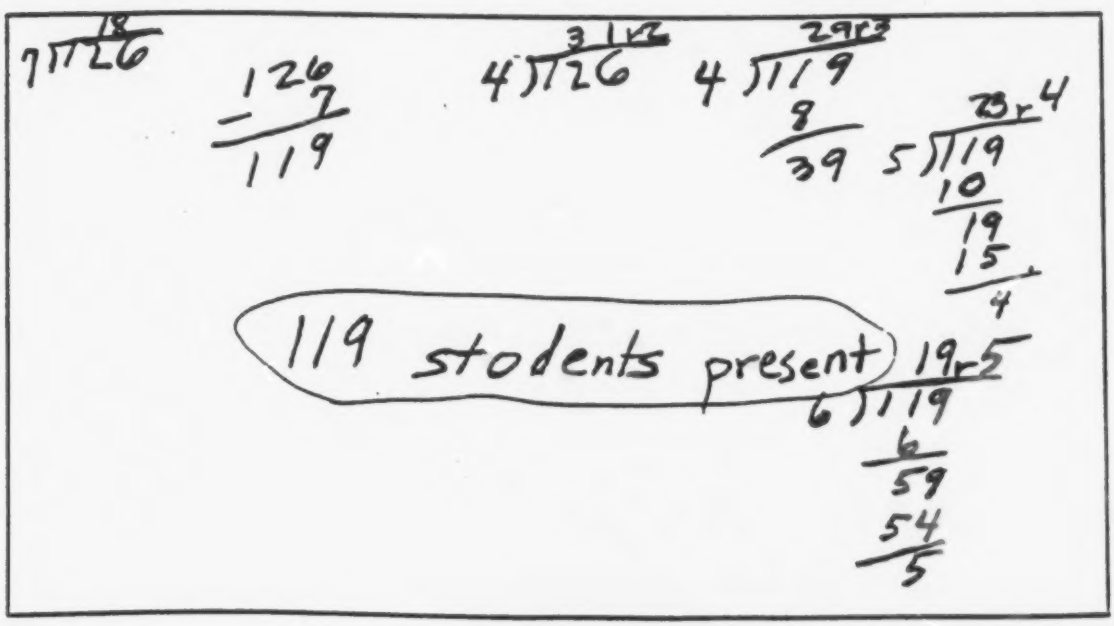
Directions

Show all of your work and write your answers directly in this booklet.

Your local high school marching band is marching in today's state fair parade. The band, composed of 126 students, usually marches in 21 rows of 6 students each. Due to illness, several band members are unable to march in today's parade.

As drum major, you must assist the band director in rearranging the students into rows of equal numbers of students. When you tried 4 students in each row, the last row was 1 student short. The results were the same when rows of 5 and 6 students were arranged. When you arranged the band into rows of 7 students, all rows were complete.

Use the above information to determine how many students showed up to march in the parade. In the box below, explain how you found the number of students that were present on the day of the parade.



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MISSOURI MATH
FORM B
GRADE 8

ITEM 1/ SESSION 2	*ANCHOR*	*SCORE POINT 3*

Student's response substantially addresses the performance event

Communicates most steps of the solution

- *Determines which multiple meets the requirement of one student short in each row (119 ÷ 4 = 31 r2, 119 ÷ 5 = 23 r4, 119 ÷ 6 = 19 r5)*
- *Gives a multiple of 7 (126 ÷ 7 = 18)*
- *Shows how they arrived at 119 (126 - 7 = 119)*

The response fails to

- *Give an explanation of their process*

160

42

SCORE 2

Directions

Show all of your work and write your answers directly in this booklet.

1 Your local high school marching band is marching in today's state fair parade. The band, composed of 126 students, usually marches in 21 rows of 6 students each. Due to illness, several band members are unable to march in today's parade.

As drum major, you must assist the band director in rearranging the students into rows of equal numbers of students. When you tried 4 students in each row, the last row was 1 student short. The results were the same when rows of 5 and 6 students were arranged. When you arranged the band into rows of 7 students, all rows were complete.

Use the above information to determine how many students showed up to march in the parade. In the box below, explain how you found the number of students that were present on the day of the parade.

7
14
21
28
35
42
49
56
63
70
77
84
91
98
105
112
119

000 3

31 ½

31 2

125 31 + 1

I made a picture to figure it out

119 students showed up

174097

MISSOURI MATH
FORM B
GRADE 8

ITEM 1/ SESSION 2	*ANCHOR*	*SCORE POINT 2*

Student's response partially addresses the performance event

Communicates some steps on the solution

- *Gives multiples of 7*
- *Determines that there were 119 students present*
- *Gives a partial explanation of the problem--I made a picture to figure it out--shows the picture*

The response fails to

- *Determine which multiple meets the requirement of one student short in each row*

102

44

SCORE 1

Directions

Show all of your work and write your answers directly in this booklet.

1 Your local high school marching band is marching in today's state fair parade. The band, composed of 126 students, usually marches in 21 rows of 6 students each. Due to illness, several band members are unable to march in today's parade.

As drum major, you must assist the band director in rearranging the students into rows of equal numbers of students. When you tried 4 students in each row, the last row was 1 student short. The results were the same when rows of 5 and 6 students were arranged. When you arranged the band into rows of 7 students, all rows were complete.

Use the above information to determine how many students showed up to march in the parade. In the box below, explain how you found the number of students that were present on the day of the parade.

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MISSOURI MATH
FORM B
GRADE 8

ITEM 1/ SESSION 2	*ANCHOR*	*SCORE POINT 1*

Student's response minimally addresses the performance event
Communicates few steps of the solution

- *Gives the answer of 119 students*

The response fails to

- *Determine which multiple meets the requirement of one student short in each row. Just showing 119 ÷ 4 = . 119 ÷ 5 = . 119 ÷ 6 = . is not enough to earn the student any credit*
- *No work was given*
- *Give an explanation of their process*

SCORE 1

Directions

Show all of your work and write your answers directly in this booklet.

1 Your local high school marching band is marching in today's state fair parade. The band, composed of 126 students, usually marches in 21 rows of 6 students each. Due to illness, several band members are unable to march in today's parade.

As drum major, you must assist the band director in rearranging the students into rows of equal numbers of students. When you tried 4 students in each row, the last row was 1 student short. The results were the same when rows of 5 and 6 students were arranged. When you arranged the band into rows of 7 students, all rows were complete.

Use the above information to determine how many students showed up to march in the parade. In the box below, explain how you found the number of students that were present on the day of the parade.

17 • 7 = 119

If you had 17 rows of 7 students. 119 students showed up.

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178937

Go On

MISSOURI MATH
FORM B
GRADE 8

ITEM 1/ SESSION 2	*ANCHOR*	*SCORE POINT 1*

Student's response minimally addresses the performance event

Communicates few steps of the solution

- *Gives the answer of 119 students*
- *Gives a multiple of 7--(17 x 7 = 119)*

The response fails to

- *Give an explanation of their process*
- *Determine which multiple meets the requirement of one student short in each row*

106

48

SCORE 0

Directions

Show all of your work and write your answers directly in this booklet.

Your local high school marching band is marching in today's state fair parade. The band, composed of 126 students, usually marches in 21 rows of 6 students each. Due to illness, several band members are unable to march in today's parade.

As drum major, you must assist the band director in rearranging the students into rows of equal numbers of students. When you tried 4 students in each row, the last row was 1 student short. The results were the same when rows of 5 and 6 students were arranged. When you arranged the band into rows of 7 students, all rows were complete.

Use the above information to determine how many students showed up to march in the parade. In the box below, explain how you found the number of students that were present on the day of the parade.

$126 \div 7 = 18$

18 students were absent

107

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MISSOURI MATH
FORM B
GRADE 8

ITEM 1/ SESSION 2	*ANCHOR*	*SCORE POINT 0*

Other--Work indicates no mathematical understanding of the task

- *Gives a multiple of 7, but uses the number obtained as the answer to the problem*
- *Shows no understanding of the process*
- *Does not give an explanation of their process*

Each square inch of honeycomb contains 25 cells. How many cells would be found in a honeycomb that measures 8 inches by 12 inches? In the box below, provide the work that shows how you arrived at your answer.

SCORE 2

Correct process

$8 \cdot 12 = 96$

$96 \cdot 25 =$ 2400 cells

Correct answer

Exemplary Response

Session 2

BEST COPY AVAILABLE

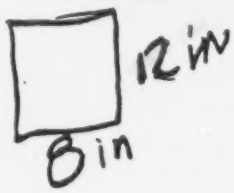
2 Each square inch of honeycomb contains 25 cells. How many cells would be found in a honeycomb that measures 8 inches by 12 inches? In the box below, provide the work that shows how you arrived at your answer.

SCORE 1

$8 \times 12 = 96 \div 25 = 3$

Correct area with process shown

Incorrect answer



110

180347

Go On

2 Each square inch of honeycomb contains 25 cells. How many cells would be found in a honeycomb that measures 8 inches by 12 inches? In the box below, provide the work that shows how you arrived at your answer.

SCORE 0

(25×8) (25×12)
200 300

Incomplete process

200 + 300 = 500

Incorrect answer

500 cells in a honeycomb

3 Use your protractor to help you solve this problem.

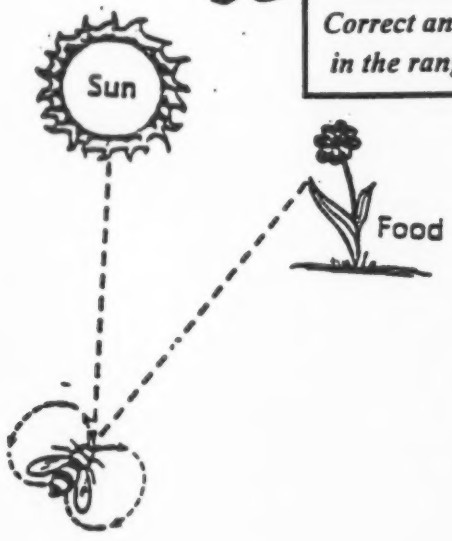
SCORE 1

A honeybee shows the location of food to other bees by dancing a figure-eight pattern inside the hive. The imaginary line between the loops of the figure eight indicates the position of the food in relation to the sun, as shown below.

What is the measurement of the angle between the sun and the honeybee's food?

35°

Correct answer—Angle measures in the range of 33° to 37°



Exemplary Response

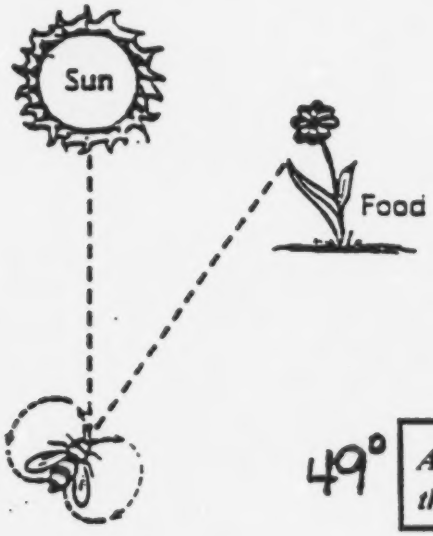
3

Use your protractor to help you solve this problem.

SCORE 0

A honeybee shows the location of food to other bees by dancing a figure-eight pattern inside the hive. The imaginary line between the loops of the figure eight indicates the position of the food in relation to the sun, as shown below.

What is the measurement of the angle between the sun and the honeybee's food?



49°

Angle measured is not within the acceptable range of 33° to 37°

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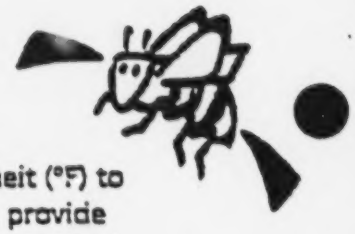


4

The honeybee must have a body temperature of at least 85° Fahrenheit (°F) to be able to fly. What is this temperature in Celsius? In the box below, provide the work that shows how you arrived at your answer.

SCORE 2

$86°F = X°C$

$X = \frac{5}{9}(86° - 32)$ *Correct process*

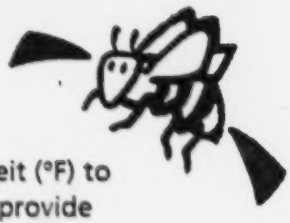
$X = \frac{5}{9}(54)$

$X = 30$ *Correct answer*

Exemplary Response

Session 2

BEST COPY AVAILABLE



The honeybee must have a body temperature of at least 86° Fahrenheit (°F) to be able to fly. What is this temperature in Celsius? In the box below, provide the work that shows how you arrived at your answer.

SCORE 1

Correct process

$C = \frac{5}{9}(85-32)$

$\frac{5}{9} \cdot 53 = \frac{265}{9}$

$85 - 32 = 53$

$53 \times 5 = 265$

27.2°C

Error in transcription– wrote 85 instead of 86

$9\overline{)265}$ → 27.2

Error in computation gives wrong answer

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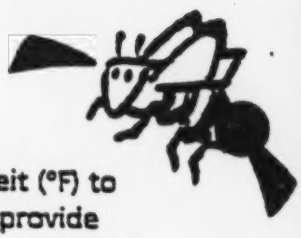


4 The honeybee must have a body temperature of at least 86° Fahrenheit (°F) to be able to fly. What is this temperature in Celsius? In the box below, provide the work that shows how you arrived at your answer.

SCORE 0

86° Fahrenheit
Celsius

$F = (\frac{9}{5}C) + 32$

$C = \frac{5}{9}(F - 32) = -64$

$= -64°$

No process

Incorrect answer

Session 2

The eighth graders at your school decided to create a plan for an outdoor lunch yard where students could eat their lunch during nice weather. Before approaching the principal, the students made a scale drawing to help them present their idea.

5

Use your ruler to help you solve this problem.

The students thought it would be nice to include a flower garden in the lunch area. What is the *actual* area of the flower garden? In the box below, provide the work that shows how you arrived at your answer. Be sure to include the unit of measure for the area of the flower garden with your answer.

SCORE 3

1½ inches = 8+4 = 12
2½ inches = 16+4 = 20

12b x 20h = $\frac{240}{2}$

120 sqft

Correct process

Correct answer

Exemplary Response

Session 2

BEST COPY AVAILABLE

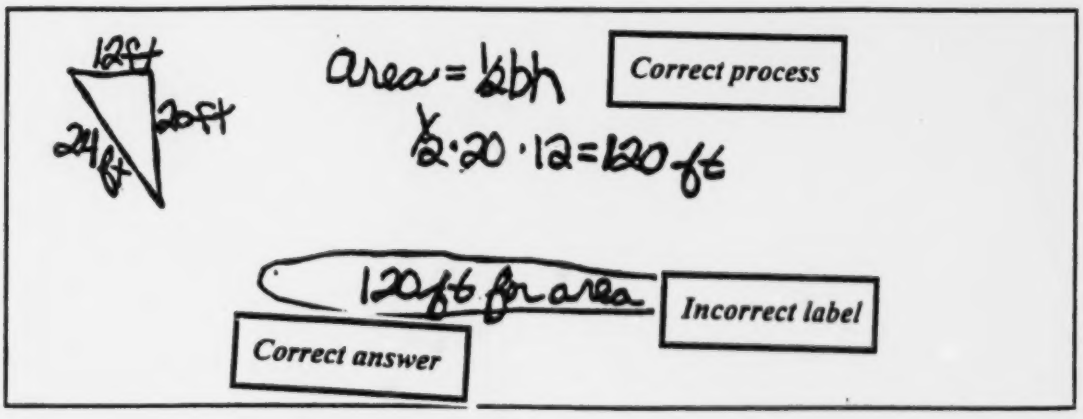
The eighth graders at your school decided to create a plan for an outdoor lunch yard where students could eat their lunch during nice weather. Before approaching the principal, the students made a scale drawing to help them present their idea.

5

Use your ruler to help you solve this problem.

The students thought it would be nice to include a flower garden in the lunch area. What is the ***actual*** area of the flower garden? In the box below, provide the work that shows how you arrived at your answer. Be sure to include the unit of measure for the area of the flower garden with your answer.

SCORE 2



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115
Session 2

60

The eighth graders at your school decided to create a plan for an outdoor lunch yard where students could eat their lunch during nice weather. Before approaching the principal, the students made a scale drawing to help them present their idea.

5

Use your ruler to help you solve this problem.

The students thought it would be nice to include a flower garden in the lunch area. What is the *actual* area of the flower garden? In the box below, provide the work that shows how you arrived at your answer. Be sure to include the unit of measure for the area of the flower garden with your answer.

SCORE 1

8+4=12x
16+4=F 20x
16+8 24

the area will be 1920

One correct process shown for that process–conversion of inches to feet

Incorrect answer

BEST COPY AVAILABLE

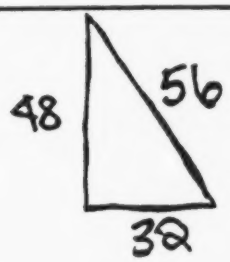
The eighth graders at your school decided to create a plan for an outdoor lunch yard where students could eat their lunch during nice weather. Before approaching the principal, the students made a scale drawing to help them present their idea.

5

Use your ruler to help you solve this problem.

The students thought it would be nice to include a flower garden in the lunch area. What is the ***actual*** area of the flower garden? In the box below, provide the work that shows how you arrived at your answer. Be sure to include the unit of measure for the area of the flower garden with your answer.

SCORE 0



Incorrect process

A = 136 ft.

Incorrect answer

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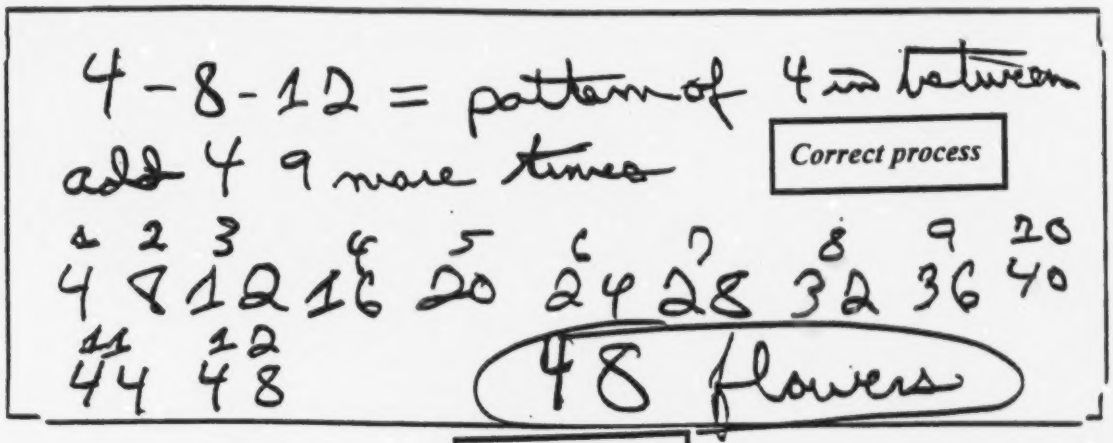
120

6

The students want to plant flowers in rows to fit the garden's shape. The first row will have 4 flowers, the second row will have 8 flowers, and the third row will have 12 flowers. If the pattern continues, how many flowers will be in the *twelfth* row? In the box below, provide the work that shows how you arrived at your answer.

SCORE 2


4-8-12 = pattern of 4 in between
add 4 9 more times
Correct process
1 2 3 4 5 6 7 8 9 10
4 8 12 16 20 24 28 32 36 40
11 12
44 48
48 flowers
Correct answer

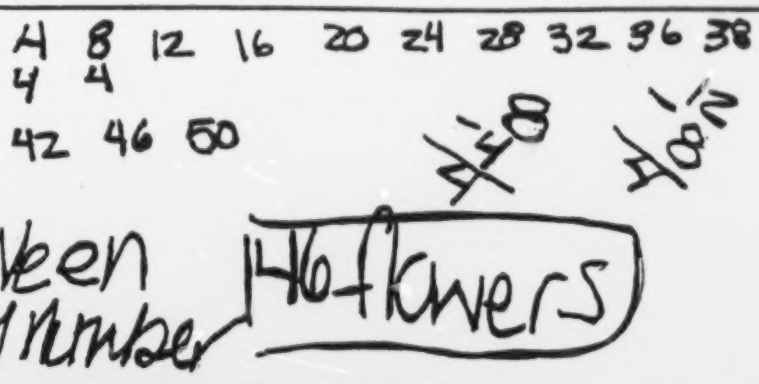
Exemplary Response

BEST COPY AVAILABLE

D The students want to plant flowers in rows to fit the garden's shape. The first row will have 4 flowers, the second row will have 8 flowers, and the third row will have 12 flowers. If the pattern continues, how many flowers will be in the *twelfth* row? In the box below, provide the work that shows how you arrived at your answer.

SCORE 1

Correct process



Error in computation gives wrong answer--got off track when they added 2 to 36 and went back to adding 4

Session 2

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186812

The students want to plant flowers in rows to fit the garden's shape. The first row will have 4 flowers, the second row will have 8 flowers, and the third row will have 12 flowers. If the pattern continues, how many flowers will be in the ***twelfth*** row? In the box below, provide the work that shows how you arrived at your answer.

SCORE 0

12-3=9X4=36+24=60 Flowers in last row

Incorrect process

Incorrect answer

Go On

Session 2

BEST COPY AVAILABLE

109762

7

DEAR Principal,

SCORE

We put out 165 gallons of garbage and recycled goods each day. We have done research to find out which Garbage can would be cheaper yet still hold enough garbage. Garbage can B is the Best one to get it holds 34 gallons of trash so we only need to get 5, which will cost $69.95. Garbage Can A only hold 30 gallons so you would need to get 6, which would cost $71.94. ($2.00 less). We recaomend you get garbage Can B to save money.

Sincerly,

Your loving Students

Correct response

Correct process

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Exemplary Response

7

SCORE 2

Dear Principal,

Hello!

Correct recommendation

we the eighth-grade students, think you should consider "Garbage can B"! We think this because this can holds 4 more gallons than can A, and with can a you would have to buy 6 garbage cans to hold 165 gallons of trash, but with can B you only have to buy 5 cans.

Thanks

Partial justification—figured out they would need 6 of trash can A and 5 of trash can B

#7

SCORE 1

Garbage can B.
It holds more, it's plastic and it's bigger but we have to pay more.

Correct recommendation

7

SCORE 0

Dear Principal,

This is a letter regarding the choice of which garbage can to use for the outdoor lunch yard. We recommend you use Gabage Can A. It is cylinder in shape, 3ft tall w/a 1ft. radius. It will hold 30 gallons + is made up of galvanized steel. the cost per trash can is $11.99. Garbage can B will hold 11 gallons more, but it is made of plastic which would probably not hold up as well a steel. I hope we have made a good decision for the lunch yard!

Thanks

Incorrect answer

Justification given was insufficient to score– no mathematical understanding of why trash can B should be chosen

Repeats information given– no mathematical understanding of the task

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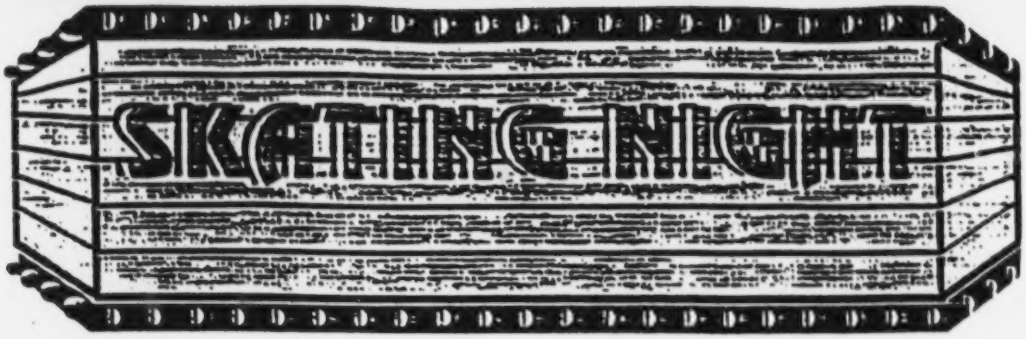

Directions

Numbers 1 through 6 are about a school skating night. Show all of your work and write your answers directly in this booklet.

8 The student council at your school wants to sponsor a family skating night at a local roller rink. The skating night is going to be a fundraiser to help purchase new sports equipment for the school. The students have discussed how to encourage ticket sales so that there will be a good turnout for the event.

They decide that each of the 5 student officers will call 5 eighth graders to tell them about the skating night. Each of those eighth graders will call 3 seventh graders. Assuming that no person is called more than once, how many seventh graders would be called? In the box below, provide the work that shows how you arrived at your answer.

SCORE 2

$5 \times 5 = 25$ eighth graders

Correct process

$25 \times 3 = 75$ 7th graders

Correct answer

128

Exemplary Response

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SCORE 1

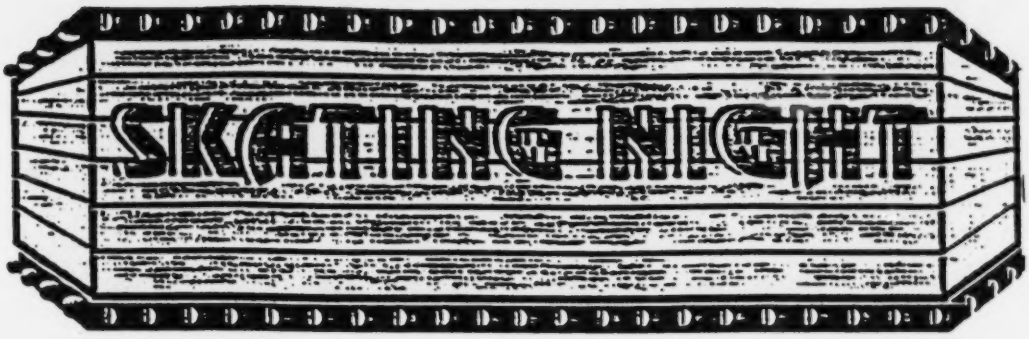
$\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$ $\begin{array}{r} 25 \\ \times 3 \\ \hline 625 \end{array}$ 625 7th graders

Correct process

Error in computation gives wrong answer

129

155660



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SCORE 0

5
x 3
15 seventh graders

Incomplete process

Incorrect answer– 15 seventh graders

3+3+3+3+3

5 = 8th graders
3 = 7th graders each

Session 2

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